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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/050,797	01/18/2002	Kazuichi Isaka	111697	9586
25944	7590	04/30/2004	EXAMINER	
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			NAFF, DAVID M	
			ART UNIT	PAPER NUMBER
			1651	

DATE MAILED: 04/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/050,797

Applicant(s)

ISAKA ET AL.

Examiner

David M. Naff

Art Unit

1651

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 10 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2,6 and 9-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2, 6 and 9-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

The amendment of 2/10/04 canceled claims 1, 3-5, 7 and 8, amended claims 2 and 6, and added new claims 9-24.

Claims examined on the merits are 2, 6 and 9-24, which are all
5 claims in the application.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C.

112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the
15 best mode contemplated by the inventor of carrying out his invention.

Claims 2, 6 and 9-24 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not
20 described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Support is not readily apparent in the specification for the hydrophilic group having affinity for the microorganism and the
25 hydrophobic group adsorbing the exogenous-disrupting chemical. The page and line should be pointed out where the claim language is set forth in the specification.

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Claim Rejections - 35 USC § 112

Claims 9-23 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the percentage range of hydrophobic prepolymer of claim 2 when carrying out the embodiment of 9 and for the ratio of hydrophilic group to hydrophobic group of claims 6 or 24 when carrying out the embodiment of claims 10 and 23, does not reasonably provide enablement for amounts outside the ranges of claims 6, 9 and 24. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

The specification discloses (page 4, lines 24-31 and page 5, lines 21-32) that if the amounts used are outside the claimed ranges undesirable results are obtained.

Claim Rejections - 35 USC § 112

Claim 23 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claim is unclear as to the relationship of the polymer in (1) to the microorganisms in (2). The claim should require the microorganisms to be immobilized in the polymer.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless -

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 6, 10, 13, 14, 17, 18 and 21-24 are rejected under 35 U.S.C. 102(e) as being anticipated by Sumino et al (6,576,451 B1) (newly applied).

The claims are drawn to a method of producing a microorganism-immobilized carrier for removing an exogenous endocrine-disrupting chemical in water by mixing microorganisms and a prepolymer having a hydrophilic group and a hydrophobic group mixed in its molecule, and polymerizing the prepolymer to form the microorganism-immobilized carrier containing the microorganisms inclusively immobilized, and wherein the hydrophilic group has affinity for the microorganisms and the hydrophobic group adsorbs the exogenous endocrine-disrupting chemical and it is decomposed by the microorganisms. Also claimed is the resultant microorganism-immobilized carrier, and a method of removing an exogenous endocrine-disrupting chemical in water by bringing the water into contact with the microorganism-immobilized carrier.

Sumino et al disclose mixing a microorganism with an oligomer and polymerizing the oligomer to form a gel that inclusively entraps the microorganism (col 3, lines 17-20, col 5, lines 56-61 and col 8, line 2). The gel containing the entrapped microorganism is used in

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decomposing endocrine disrupter related compounds (col 1, lines 54-60) such as bisphenol A (paragraph bridging cols 7 and 8, and col 8, lines 35-43). The gel containing the microorganism is put in a reaction vessel (col 9, line 15 and col 10, line 31), and waste water containing an endocrine disrupter related compound is contacted with the gel. The oligomer contains a main structure composed of a polyalkylene glycol that is a block copolymer formed of ethyleneoxy and hydrophobic propyleneoxy (col 4, lines 25-30). The ratio of propyleneoxy is smaller than that of ethyleneoxy (col 4, lines 54-56). The ethyleneoxy has affinity for the microorganism (col 4, lines 15-17).

The oligomer of Sumino et al is a prepolymer having a hydrophilic group (ethyleneoxy) and a hydrophobic group (propyleneoxy), and polymerizing the oligomer in the presence of a microorganism as disclosed by Sumino et al results in a method of producing a microorganism-immobilized carrier as presently claimed for removing an exogenous endocrine-disrupting chemical. The gel containing inclusively entrapped microorganisms obtained by Sumino et al is the same the microorganism-immobilized carrier resulting from the presently claimed method. The ethyleneoxy will inherently have affinity for the microorganism and the propyleneoxy will inherently adsorb an exogenous endocrine-disrupting chemical. The oligomer and resultant polymer of Sumino et al will inherently have a ratio of hydrophilic group to hydrophobic group as required by claims 6 and 24. Removing bisphenol A from waste water with the gel in a reaction

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vessel as disclosed by Sumino et al is a method that is the same as required by claims 17, 18 and 21-24.

Claim Rejections - 35 USC § 103

Claims 2, 9, 11, 12, 15, 16, 19 and 20 are rejected under 35
5 U.S.C. 103(a) as being unpatentable over Sumino et al in view of
Gutttag (3,860,490) (newly applied).

The present claims differ from claims 6, 10, 13, 14, 17, 18 and
21-24 by requiring producing the microorganism-immobilized carrier by
mixing the microorganism with a hydrophilic prepolymer containing a
10 hydrophilic group and a hydrophobic prepolymer containing a
hydrophobic group, and polymerizing.

Sumino et al is described above. Additionally, Sumino et al
disclose a comparative example (col 9, lines 60-64) using a
conventional ethyleneoxy oligomer which is a derivative of
15 polyethylene glycol containing an acryloyl group or a metacryloyl
group on each end.

Gutttag disclose immobilizing a microorganism by polymerizing a
mixture containing monomers and the microorganism (col 5, lines 50-
60). Monomers present may be hydrophilic monomers (paragraph bridging
20 cols 2 and 3) and monomers which are hydrophobic (col 3, lines 34-36)
to produce a copolymer containing the microorganism entrapped therein.

When carrying out the comparative example of Sumino et al, it
would have been obvious to copolymerize the polyethylene glycol
derivative which is hydrophilic with a polypropylene glycol derivative
25 containing an acryloyl group or a metacryloyl group on each end which

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is hydrophobic to prevent the microorganism from decomposing a gel made of only the polyethylene glycol derivative as suggested by Sumino et al disclosing forming a block copolymer of ethyleneoxy and hydrophobic propyleneoxy to prevent the microorganism from decomposing the gel when only ethyleneoxy is present (col 4, lines 15-22) and as suggested by Gutttag disclosing polymerizing a mixture a hydrophilic monomer and a hydrophobic monomer to producing a copolymer entrapping a microorganism. Since Sumino et al suggest that the amount of propyleneoxy should be less than the amount of ethyleneoxy (col 4, lines 54-56), it would have been obvious to use an amount of hydrophobic prepolymer within the range of claim 2. Sumino et al use the entrapped microorganism from the comparative example in the same way as the entrapped microorganism from polymerizing the oligomer of the invention, and when carrying out the modification set forth above, it would have been obvious to use the entrapped microorganism to remove an exogenous endocrine-disrupting chemical from water as in present claims 15, 16, 19 and 20.

Response to Arguments

Applicants' arguments in the response filed 2/10/04 are moot in view of the newly applied references.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David M. Naff whose telephone number is 571-272-0920. The examiner can normally be reached on Monday-Friday 9:30-6:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mike Wityshyn can be reached on 571-272-0926. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



David M. Naff
Primary Examiner
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